

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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Ex parte MARC SEGHAOL

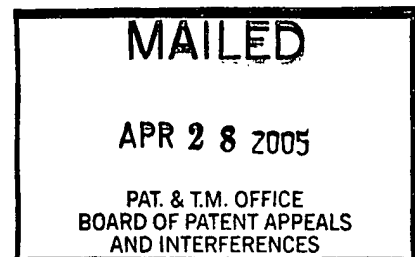
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Appeal No. 2005-0966  
Application No. 09/897,317

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ON BRIEF

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Before FRANKFORT, MCQUADE, and NASE, Administrative Patent Judges.  
FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 6, 13, 14 and 16, all of the claims remaining in this application. Claims 7 through 12, 15 and 17 through 28 have been cancelled.

As noted on page 1 of the specification, appellant's invention relates to a hand-held microwave system for intra-oral dentistry that utilizes microwave energy to cure polymer materials intra-orally to produce dental composites having improved physical characteristics, and also utilizes microwave energy to detect the presence of and to

preferentially heat caries or cavities, thereby disinfecting and therapeutically treating the caries in a potentially non-invasive manner. Independent claims 1, 14 and 16 are representative of the subject matter on appeal and a copy of those claims can be found in the Appendix to appellant's brief.

The sole prior art reference relied upon by the examiner in rejecting the appealed claims is:

Stevens et al. (Stevens)	5,421,727	Jun. 6, 1995
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Claims 1 through 6, 13, 14 and 16 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 14 of appellant's prior U.S. Patent No. 6,254,389.

Claim 1 also stands rejected under 35 U.S.C. § 102(b) as being anticipated by Stevens.

Claims 2 through 5 and 14 additionally stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stevens.<sup>1</sup>

Rather than attempt to reiterate the examiner's full commentary with regard to the above-noted rejections and the conflicting viewpoints advanced by the examiner and appellant regarding the rejections, we make reference to the examiner's answer (mailed November 4, 2003) for the reasoning in support of the rejections, and to appellant's brief (filed August 14, 2003) and reply brief (filed January 12, 2004) for the arguments thereagainst.

### OPINION

In reaching our decision in this appeal, we have given careful consideration to appellant's specification and claims, to the applied prior art Stevens reference, and to the respective positions articulated by appellant and the examiner. As a consequence of our review, we have made the determinations which follow.

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<sup>1</sup>There are no prior art rejections of claims 6, 13 and 16. In the advisory action mailed April 25, 2003, the examiner indicates that claims 6, 13 and 16 would be allowable if rewritten in independent form and upon filing of a proper terminal disclaimer.

Looking at page 3 of the answer, we note that the examiner has indicated that appellant has not contested the rejection of claims 1 through 6, 13, 14 and 16 based on obviousness-type double patenting, but has instead indicated that a terminal disclaimer will be filed once all other grounds of rejection have been resolved. Given that no terminal disclaimer has been filed by appellant and no argument made with respect to this ground of rejection in either the brief or reply brief, we summarily sustain the examiner's rejection of claims 1 through 6, 13, 14 and 16 based on obviousness-type double patenting.

Regarding the examiner's rejection of claim 1 under 35 U.S.C. § 102(b) based on Stevens, we note that Stevens discloses a microwave dental system comprising a hand-held dental tool (Fig. 5) including: an antenna (422) positioned at a distal end of the tool and sized and configured to be selectively positioned within a mouth of a patient adjacent at least one tooth, a wave guide connectable (at 440) to the tool body and antenna, and a source of microwave energy (e.g., 50) operably coupled to the wave guide for controlling delivery of microwave energy to the wave guide (see, e.g., col. 3, lines 33-34). As noted in the paragraph bridging columns 3 and 4, the amount of energy supplied to the tool of Stevens

may be selected to slightly warm the region to enhance the efficacy of a disinfectant liquid or to improve blood flow, to heat sufficiently to disinfect in the absence of a disinfectant liquid, or to kill tissue or coagulate it into a

cohesive mass, or to cause a glazing of tooth structure aimed at decreasing its permeability to fluids or microorganisms, or to melt sealing material evenly in the root canal.

Although it is true that the tool (401) when used as disclosed in Stevens would be inserted into a natural or man-made tooth cavity (36) in a manner similar to that seen in Figures 2 and 3a of that patent, it is nonetheless also true that the antenna (422) positioned at the distal end of the tool seen in Figure 5 of Stevens is sized and “configured to be selectively positioned within a mouth of a patient adjacent at least one exterior surface of a tooth,” as set forth in claim 1 on appeal. Thus, the antenna of Stevens hand-held dental tool (401) is clearly capable of the use set forth in claim 1 on appeal and any limitation on the structure of the antenna in appellant’s claim 1 would be met by the tool and antenna seen in Figure 5 of Stevens, even though Stevens does not expressly teach the particular recited use. In that regard, we note that the claims on appeal are directed to a microwave dental system and hand-held tool per se and not to a method of using such a tool to treat dental caries. Moreover, it is apparent to us that immediately prior to its insertion into the tooth cavity depicted in Figures 2 and 3a of Stevens, the tool (401) of Stevens and particularly the antenna (422) at the end of the tool as seen in Figure 5 would be “positioned within a mouth of a patient adjacent at least one exterior surface of a tooth.”

Concerning appellant's arguments in the brief and reply brief that the antenna of Stevens tool (401) requires two parts, a first electrode to be inserted into the drilled hole in the interior of the tooth (e.g., element 422 of Fig. 5) and a second electrode of the antenna (i.e., 42) located outside the cheek (Fig. 2) or at the base of the gums (Fig. 3a), we see the embodiment of the tool shown in Figure 5 of Stevens to be different than that shown in Figures 2 and 3a of the patent. More particularly, we note that Stevens expressly indicates that the element (422) located at the distal end of the tool (401) is an "antenna" and more specifically that it is an "unbalanced antenna, in which the electrical currents flowing on a portion of the exterior of the surface of body 410 coact with similar currents flowing on center conductor extension 414e to effect the antenna radiation" (col. 4, line 67 - col. 5, line 3). Note also the disclosure at column 5, lines 20-26, wherein connection of the source (e.g., 50) to the tool (401) and antenna is described, and wherein it is made clear that the antenna (422) is operational without including a second electrode (42) located outside the cheek as in Figure 2 or at the base of the gums as in Figure 3a.

As for appellant's argument that the tool of Stevens does not include disclosure that "microwave energy is applied at a frequency and power to preferentially heat caries," we again note that the claims on appeal are directed to a microwave dental system and hand-held tool per se, and not to a method of using such a tool to treat

dental caries. Moreover, we share the examiner's view that given the wide range of uses disclosed in Stevens (e.g., col. 3, line 64 - col. 4, line 4), it is apparent that the tool of Stevens operates over a wide power and frequency range and thus would inherently be capable of applying microwave energy at a frequency and power to preferentially heat caries. This is especially true since both appellant and Stevens disclose the use of microwave energy at a frequency and power level to disinfect and therapeutically treat teeth or to kill infected tissue in teeth, and since appellant's own specification (page 4, lines 1-7) indicates that those of ordinary skill in the art at the time of the present invention would have been aware of the higher absorbency behavior of carious tissue when irradiated by microwave energy as compared to the lower absorbency of microwave energy by healthy enamel and dentin, thereby providing preferential heating of caries. Thus, heating via microwave energy as in Stevens, whether at a frequency and power level to disinfect a tooth or kill infected tissue therein, or at a frequency and power level to cause a glazing of tooth structure aimed at decreasing its permeability to fluids and micro-organisms, would clearly provide preferential heating of caries in the tooth vis-a-vis healthy enamel and dentin of the tooth even though Stevens does not specifically address such heating.

Contrary to appellant's assertions in the brief (page 5), we do not see that the uses expressly taught by Stevens are "much different than the use of heating caries

material as disclosed in the present invention.” Moreover, we find no clear line of reasoning or evidence provided by appellant to support any such conclusion.

Based on the foregoing, we will sustain the examiner’s rejection of claim 1 under 35 U.S.C. § 102(b) as being anticipated by Stevens.

Regarding the examiner’s rejection of claims 2 through 5 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Stevens, we note that given the wide range of uses expressly set forth in the patent (e.g., col. 3, line 64 - col. 4, line 4) and the lack of any specific guidance as to particular frequencies and power levels necessary to achieve such uses, we must agree with the examiner that it would have been obvious to one of ordinary skill in the art at the time of appellant’s invention to design the system of Stevens so that it has the capability of operation at frequencies and power levels encompassing the broad ranges set forth in the claims on appeal (i.e., at relatively low power levels of “less than 10 watts,” at frequencies between 1 Ghz and 50 Ghz, and at voltages in a range of between 10 and 65 volts). In that regard, we again observe that both appellant and Stevens use microwave energy to destroy micro-organisms in the tooth to thereby disinfect the tooth material as a direct result of the temperature rise therein, and also to seal the tooth (e.g., by glazing of the tooth structure) to decrease its



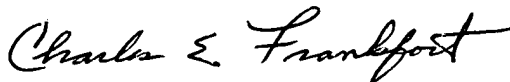
permeability to fluids and micro-organisms, thereby requiring application of microwave energy at similar power levels and frequencies. Moreover, as noted in In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. We also note that one must presume skill on the part of the artisan, rather than the converse. See In re Sovish, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir 1985).

In view of the foregoing, the examiner's rejection of claims 2 through 5 and 14 of the present application under 35 U.S.C. § 103(a) is sustained.

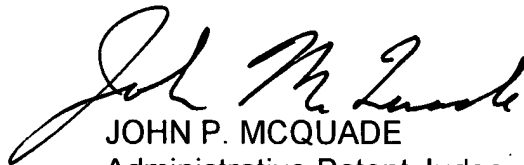
To summarize, the decision of the examiner to reject claims 1 through 6, 13, 14 and 16 under the judicially created doctrine of obviousness-type double patenting is affirmed. In addition, the examiner's decision to reject claim 1 under 35 U.S.C. § 102(b) based on Stevens is affirmed, as is the decision to reject claims 2 through 5 and 14 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal  
may be extended under 37 CFR § 1.136(a).

AFFIRMED



CHARLES E. FRANKFORT  
Administrative Patent Judge



JOHN P. MCQUADE  
Administrative Patent Judge



JEFFREY V. NASE  
Administrative Patent Judge

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